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ANALYSIS OF MEMORY.

Memory: an Inductive Study. By F. W. Colegrove, Ph.D., D.D., Professor of Philosophy in the University of Washington. With an introduction by G. Stanley Hall, LL.D. Pp. xi + 369. (London: G. Bell and Sons. New York: Henry Holt and Co., 1901.) Price 6s. net.

THE title of this book—"An Inductive Study"—leads us to expect an exposition of fundamental and derivative generalities based on a logical arrangement of thoroughly criticised facts. Facts and generalities there are in plenty, but the criticism is not adequate, neither is the arrangement conspicuously logical. The result is that, in spite of Dr. Stanley Hall's commendation, the book as a whole leaves on one an impression of chapters loaded with detail yet not adding much to the scientific study of memory. Prof. Colegrove has taken great pains, but he has attempted too much in a small book, and his standpoint is neither frankly scientific nor frankly popular. In Chapter i.—"Historical Orientation"—he makes a rapid sweep from the Greeks to the moderns, indicating the transit from the unsystematic *aperçus* of the earlier schools to the positive methods of the later. The conception is good, but the space available makes even a tolerable sketch impossible. Even the characterisations given are sometimes more than doubtful. It is quite inaccurate, for instance, to say that in contrast with Kant's "masterly analysis of mind," "Reid, Stewart and Hamilton are wholly metaphysical" (p. 10). Then, the account of Bain's formula for the nervous seat of reproduced feelings—"the renewed feeling occupies the very same parts, and in the same manner, as the original feeling, and no other parts, nor in any other assignable manner"—becomes "mental impressions depend upon the renewal of the feeling which accompanies the same part and in the same manner as the original feeling" (p. 14), which is practically unintelligible. Badly done summaries are worse than none, and the above—which involves a fundamental doctrine—does not alone suffer by the compression. The references, however, are, as a rule, given; the student will therefore not be misled, but the general reader also would prefer accuracy in his "orientation."

In Chapter ii.—"Biological Orientation"—we have a mass of facts, partly anecdotal, about animal intelligence generally, instincts, habits, natural selection, memory and some other things. The purpose is to lead up to the general theory of "organic memory" (Hering) and "racial memory" (p. 89). We are left without any clear conception as to whether "racial memory" implies (a) cumulative use-inheritance (Spencer), or (b) selected variations (Weismann). The difference is said to be "in part a war of words" (p. 87). Possibly, but the words are of Sibylline importance. "Organic memories refer to the ability to conserve racial experiences by a congenital modification of the organism" (p. 90) leaves the question very much an open one, even if the wording were unexceptionable. The use made of "racial memory" and "organic memory" elsewhere makes one

long to have Locke's onslaught on "innate ideas" written up to date.

In Chapter iii.—"Diseases of Memory"—Prof. Colegrove recapitulates familiar clinical facts regarding word-blindness, word-deafness and other forms of aphasia. He adds one or two striking records of traumatic loss of memory with gradual recovery (pp. 126 *et seq.*), and illustrates the theory of "inhibition" amnesia. His general conclusion that Ribot's "law of regression" demands modification, if, indeed, it holds at all, is not borne out by the cases he records. There is as much difference between the physiological sequence in normal memory decay and the shattering due to gross lesions like cerebral hæmorrhage as there is between progressive muscular atrophy and a broken leg. To make the sporadic dissociations correlated with hæmorrhage illustrate the normal sub-involution of progressive senility requires much more minute evaluation of clinical facts than we get here. The work of M. Pierre Janet would have assisted Prof. Colegrove to what we mean, but he nowhere refers to Janet.

The next chapter—"Brain and Mind"—could not, perhaps, be avoided, but it should have been reduced. Prof. Colegrove, however, takes the "correct" attitude towards the metaphysical theories he mentions, namely, that they are not in the province of psychology. The formula of "genetic parallelism," which simply means that mind and body emerge together and develop together, and "functional interaction," which means that now the physical, now the psychical, is uppermost, may be accepted as a variant on the "double-faced unity" or "parallelism" theory; but in Chapter v. the mode of expounding this relationship frequently lapses, verbally if not in content, from its presuppositions. On p. 176, where it is held that (a) the "neural discharge" and (b) the "conscious element" may, each on occasion, "take the initiative," the language seems to imply that the "conscious element" is wholly divorced from any "neural discharge." This transit in terminology from physical to psychical and *vice versa* is made again and again. The general result of the chapter is that there are "memories," not a "memory" (p. 198). This, however, is only to say that the various grades of the nervous system have each their appropriate variety of retentiveness and reproduction. In his exposition the author plays off "organic memory" against the more limited psychological "memory." He does not maintain much order in his sequence of "memories." Nor is his language always exact. That "muscular memories depend chiefly upon the nervous system" (p. 198) suggests a question that is not solved by the following sentence:—

"By exercise a muscle acquires new power, which is due in part to a change in the muscles themselves, but such memories are associated with the nervous system. This is possible because the motor nerve terminates in the centre of the muscles and throws off branches in all directions" (p. 199).

There is not much "orientation" here. Prof. Colegrove would have profited by a more intensive study of the good "psychologies," which would have enabled him to use the matter of this chapter to more purpose.

In Chapter vi.—"Individual Memories" we have the

only "inductive" effort in the book. The chapter contains a large number of moderately well-sifted facts. The author's *questionnaire* included 1658 persons of various ages and races. Some of the facts are valuable, but they are not so arranged as to elicit any striking generality. They are, indeed, like the "facts" of many other *questionnaires*, apt to be the bad observations of untrained observers. The minute study of a few cases would have been more fruitful of "inductions" than these somewhat content-less percentages of commonplace recollections. One reasonably looks for more from an "inductive" study than this on the question of "taking notes":—"There is a wide diversity of opinion as to how full notes a student should take, and almost all degrees of copiousness are indicated" (p. 270). The true inference is that most students are poor psychologists. The extremely varied suggestions for teaching a "boy to remember things *on time*" (p. 271) only show that practical pedagogy in America, as elsewhere, is more ready to punish the boy than to study his mind—punishment being as effective, on the average, as it is useless in some particular cases.

Chapter vii.—"Apperception and Association"—includes sections on recognition times, attention and interest. This chapter is one of the best in the book. The essence of Chapter viii.—"Pedagogical Applications"—is that good memory depends on attention and the attentive multiplication of associations. There is not much novelty.

Of the book as a whole, it must be said that it suffers, in every chapter, from a want of clear definition of terms and a clear analysis of the phenomena to be investigated. The references, however, are valuable and the bibliography is good.

W. LESLIE MACKENZIE.

A LUNAR ROMANCE.

The First Men in the Moon. By H. G. Wells. Pp. 312. (London: George Newnes, 1901.) Price 6s.

IT is many years now since Jules Verne wrote his imaginary account of a journey to the moon. He supposed a party of three men enclosed in a projectile shot by a huge gun towards the moon, which they never reached; they fell back to earth and escaped in a marvellous manner to tell the tale. The work was imaginative enough to hold the attention, but full of scientific blunders and improbabilities of the most glaring character. Mr. Wells has produced a book of a very different character; he has made himself master of the little we know about the moon, and thought out the possibilities with the greatest care, and the result is a narrative which we will venture to say is not only as exciting to the average reader as Jules Verne's, but is full of interest to the scientific man. We do not mean that the astronomer is likely to learn any new facts from this *résumé*, for which he himself furnished the material; but he will be astonished to find how different the few scientific facts with which he is familiar look in the dress in which a skilful and imaginative writer can clothe them, and it is worth reading the book with minute care to see if one cannot catch Mr. Wells in any little scientific slip. Some writers are so easy to catch that

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the game is not worth playing; but Mr. Wells is a worthy opponent, and we are glad to see that his scientific rank has been recognised by the Royal Institution, who have invited him to lecture on January 24.

The visit to the moon is made possible by the discovery of a substance (cavorite) impervious to gravitation. This interesting property comes to cavorite only at a critical temperature (60° F.), after "the paste has been heated to a dull red glow in a stream of helium," and the suddenness with which the imperviousness arrives causes interesting events at first. When the new conditions are better realised, a glass sphere is built and covered with cavorite blinds which can be put up or down. When all are down the sphere is entirely free from attraction, and when any particular blind is up it is only attracted by the stars or planets seen in that direction. It is obvious that in these circumstances a comfortable voyage through space is manageable. The two occupants of the sphere journey to the moon and land upon it near the terminator, on a snow drift of frozen air. With sunrise they find that the air melts and evaporates, and there is enough for them to breathe, so that they emerge from the sphere. They find their weight a trivial matter and leap twenty or thirty yards at a step, and a wonderful fungus vegetation springs up before their eyes. In the exhilaration of exploring they lose their sphere and are thus thrown on their own resources. Presently they come across the Selenites, who emerge from the interior of the moon, where they have been spending the lunar night. The first to emerge are those herding the moon calves—great beasts 200 feet long, that browse in a vividly described and rather disgusting manner ("like stupendous slugs") on a speckled green mossy plant. The cowherd was a "mere ant" by comparison, and the intelligent Selenites generally turn out to be a sort of insect, varied physically in a grotesque manner at will. After various adventures in and on the moon, one of the voyagers recovers the sphere and gets back to earth; the other stays in the moon and sends messages by ethereal telegraphy describing it more fully; and the interest never flags throughout. Following similar writings, Mr. Wells sometimes allows himself a sly hint at terrestrial matters in describing lunar affairs. He describes a lunar artist thus (p. 302):—

"Love draw. No other thing. Hate all who not draw like him. Angry. Hate all who draw like him better. Hate most people. Hate all who not think all world for to draw."

And two pages on there is a similar burlesque description of a mathematician. It is even easier to see the point than to find the pun in the following:—

"And since the density of the moon is only three-fifths that of the earth, there can be nothing for it but that she is hollowed out by a great system of caverns. There was no necessity, said Sir Jabez Flap, F.R.S., that most entertaining exponent of the facetious side of the stars, that we should ever have gone to the moon to find out such easy inferences, and points the pun with an allusion to Gruyère . . ."

Of a book so full of unfamiliar things it is impossible to give a complete account. We will conclude this notice by heartily recommending the book to readers both scientific and unscientific, and by giving, with a triumph